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Service Design pedagogy and effective student engagement: Generative Tools and Methods

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Key Terms: Service Design Education, Generative Methods, Pedagogy, Student Engagement, Complexity, Simplicity, Meaningfulness

Abstract : This practice-led investigation evaluates three generative design tools for active and tacit student engagement with postgraduate Service Design students, and their impact on the students' approach to complex design projects. In Service Design education generative design tools have a robust pedagogical role for efficient knowledge creation and student engagement, yet are still under-explored academically.

The Learn 'n' link method delineates learning as an interactive dialogic practice for creative idea conceptualisation. The Zine Method is a visual ethnography approach that can be applied holistically to frame the problem area, propose a way forward, and prototype the solution. The Narrative Toolkit enables students to discuss and critique the narrative properties of existing designs and envision design outcomes. The students then use the Zine Method to qualitatively evaluate the methods' contribution to their understanding of complex design problems and service user experience, and their function in bridging the gap between user research and generative design processes.

1. Introduction

This exploration of Service Design pedagogical methods, as well as qualitative design research approaches, develops generative pedagogical methods and tests these with service design students in a studio environment. The study is led by design academics that are practicing designers, design researchers and social innovators, aiming to contribute to the discourse on the emergence of service design pedagogy, and validating innovative design-led methods within Service Design (Service design colloquium parson school, 2013).

Studio based design pedagogy engages students and tutors in practice (Shreeve & Batchelor, 2012) and is embraced as 'constructed, self-regulated, situated, and collaborative' practice informed by design thinking as a team-based learning process (Scheer et al. 2012). Service Design, as an emerging discipline, draws on multidisciplinary practice to strategically develop innovations. Service Design Pedagogy though is still under-explored academically (Sanders.2002, Gaver.1999), methods are evolving rapidly, and generic methods informed by traditional design pedagogical practice are employed for knowledge dissemination and creation. In Service Design, which primarily focuses creativity, experimentation and innovation in the public sphere, the consideration of generative tools can support questions, building a framework for design practice and reflection. A lot of methods are adapted from the service design industry into pedagogical methods for service design. Similarly, this research re-appropriates traditional generic design pedagogy to custom-design three structured collaborative, experimental, generative design methods, with the aim of exploring effective student engagement in terms of attention, retention and innovative process.

Within Service Design practice, generative design tools have a robust role mapping, defining, developing and delivering effective and sustainable services. This research develops three customised generative design methods with an innovative pedagogical role to test efficient knowledge dissemination and student engagement. Learn n Link, Narrative Toolkit and Zine Methods delineate learning as an interactive dialogic practice; these methods draw on individual capacity as well as collaborative team dynamics enabling the students to process information with time-based knowledge mapping, connecting and analysing activities (Learn n' Link). They allow students to discuss and critique the narrative properties of envisioned design outcomes (Narrative Toolkit). In addition these methods allow the student to creatively visualise the problem area and solution and record emotion in decision-making (Zine Method). The practice identifies with the notion of cultural mapping (Duxbury 2016); an 'action journey' undertaken specifically thorough structured methods to identify and investigate the complex context within which service design operates. These methods take the students through a structured journey to absorb, assess and map knowledge creatively; to create innovative transformation strategies and services through deep reflection.

2. Design-led Evaluation Framework

The Higher Education Academy UK reports the term 'student engagement', based on definitions in the literature and the discussion of the character of engagement and its alternatives, summarised below:

Student engagement is concerned with the interaction between the time, effort and other relevant resources invested by both students and their institutions intended to optimise the student experience and enhance the learning outcomes and development of students and the performance, and reputation of the institution (Trowler, HEA, 2010).

Within Service Design, where students come from diverse backgrounds, we are conscious of making assumptions based on traditional education models. Design thinking in this context is useful to engage students creatively while learning and designing reflectively. The researchers observed engagement in

response to the methods designed. The methods presented here were specifically designed to draw on the practice of knowledge transfer in the context of co-design, organizational learning, active learning, converting tacit knowledge to explicit knowledge, collaborative knowledge construction, peer-to-peer learning and learning-by- doing. Engagement and creativity was assessed qualitatively using reflective insights, narratives around the learning experience, and zines as holistic and subjective records of the learning experience.

3. Learn n Link

Learn n Link is a two-step context mapping method for professional Service Design projects. From a design pedagogy perspective, the method is tested at design brief stage for creative idea conceptualisation. It helps facilitate identification of alleged issues within a design brief. The method is designed to facilitate students' instinctive impressions to be collated analytically into thematic design insights using a systematic format (Learn n Link Canvas Fig: 3). The method draws on reflexivity for creative knowledge generation and is examined with 14 Service Design and Innovation students in UK to understand efficacy.

Learn n Link method is carefully structured within an operational framework (Fig: 1) which helps map information in visual thematic clusters to identify problems, issues, and action points as initial service design touch points. For this paper Learn n Link was tested in design studio setting, as a class presentation, to keep it focused and measurable for evaluation purpose.

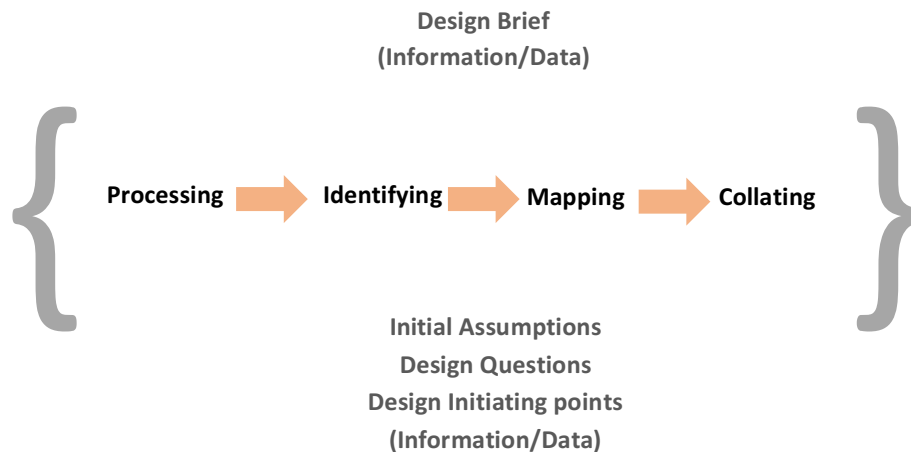


Figure 1: Learn n Link framework

Traditionally design students are required to research a design brief by mapping, absorbing, processing and reflecting creatively large chunks of information. This can be challenging to process especially when large complex data creates confusion and pressure hence students lose engagement. To address this, Learn n Link is specifically designed to turn confusion to an active learning experience by using structured word-pop and knowledge mapping activities. The method helps generate visual semantic maps as graphic structures to display meaning-based connections between a set of connected actions and design concepts, whilst retaining full student engagement throughout the session. The method commences with individual activities seamlessly transitioning into a group activity. This allows students to gradually process and analyse knowledge. Within studio setting, students' work with specific time frames to respond and time is monitored with music.

3.1: Learn (individual) Activities

Table 1: The Practice Framework

What	Active learning as an interactive dialogic practice
How	By using word-pop activity to identify, map and linking information in the shortest possible time
Why	To semantically identify and link thematic strands within a project after initial project introduction within design discovery phase as per double diamond process model
Who	MDes Service Design students
Why	Resulting visual semantic maps effectively display meaning-based connections between a set of related: design objectives, actions and concepts as exploration points that leads to more fluid open ideation phase

Students are briefed about the activity before presentation of data through a power point presentation. They are asked to think about issues, actions taken, actions need to be taken, probable solutions within the following categories (Table: 2). They asked to note down as many relevant words to *action* or *descriptive* words appearing relevant to design challenge in their notepads, in no specific order at this point, during the presentation. They are especially instructed to create rich lists of as many words as

possible. The words are then organized in lists using large sheets. As a time-based activity this helps to instinctively absorb process and reflect on data by rapid generation of key word-lists using Learn n Link Canvas (Table: 2)

Table 2: Learn n Link Canvas

Stage 1			
Learn: Processing-Identifying (Individual mapping activity)	Using <i>Learn n Link Canvas</i> Develop a key-word bank in diaries/notepads from data presented. 20 minutes power-point presentation. 5 minutes to enrich list with more words	What is the <i>problem/issue</i>	WORDS ONLY
		Why it exists: <i>factors/gaps</i>	WORDS ONLY
		How: <i>Actions that are there, or could be a possible solution/solutions</i>	WORDS ONLY

Table 2: Stage 1

Positives: Existing or Suggested			Negatives: Existing or Suggested		
Factors	Impact	Action	Factors	Impacts	Actions

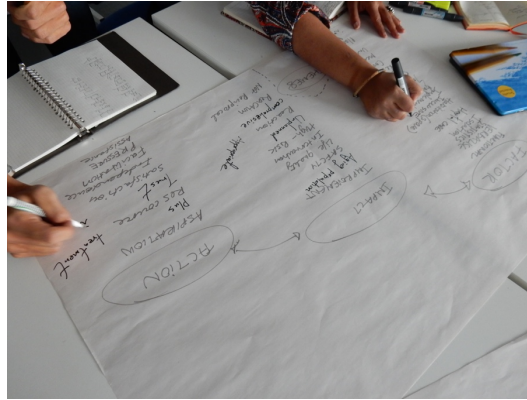
3.2: Link Activities (Group Activity)

Table 3: Stage 2

Stage 2		Add as many words to the 4 lists.	WORDS ONLY
Link		Identify connected-words	For problems, actions, solution, and reasons from what you are being shown in response to the design challenge
Mapping- Collating (A collective group activity)	Collectively Identify, Strategise, Conceptualise	Break the lists and re-make thematically	Whatever themes are evolving from lists generated in earlier stage. It could be anything, no framing at this point
		Organize thematically	Action impacts from lists and add your own ideas in the form of your own words to create more volume of ideas.
		Discuss and brainstorm.	Think of issues and problems and in response identify possible solutions (at least 5)
		Identify	Design questions, Research questions to take the research forward
		Discuss and iterate, Discuss and iterate.	Discuss and iterate, Discuss and iterate issues, challenges, possible solutions, research question-insights, design feasibilities as solutions to be developed and tested
		Prioritize	Most effective solutions on the scale of 1-2-3-4-5
		Suggest	Pitching possible design opportunities / solutions (minimum3- maximum 5). Identify next design stage (Group presentation)
		Identify	Next design phase (Group presentation with the data generated)



Stage1: Key Words



Stage1: Structuring



Stage2: Thematic Clustering



Stage 2: Design Insights



Stage 2: Strategise



Stage 2: Initial Pitch

Figure 2: Learn n Link Structured Two Stage Activities

During the second stage students are instructed to break into groups and use big sheets of paper to combine their lists and get more volume in insights. They are asked to identify themes as design touch points, collate and connect insights, develop future scenarios and define design feasibilities. Towards the end of the session they are asked to pitch five possible solutions to be further developed in the next stage. Each activity has a set time duration, which is signaled through music.

Student feedback was recorded after a week of the design sprint. They responded to open-ended questions regarding their learning experience. The questions were structured around ease with simplification of complex data and information comprehension, interest and retention, design insights and idea generation, collective and individual creative experience (team dynamics).

Even after a week, the students were quite expressive about 'achieving a lot in such a short time'. They reflected on how the learning experience felt interesting and engaging. Most of them reported an initial feeling of discomfort at being asked to work in an unconventional thinking out of the box manner, however they quickly re-adjusted to the experience, easily followed instruction and created rich lists of key words. They admitted that the unusual way of working turned into an interesting and a useful way to develop creative ideas. Using word-mapping activities demonstrated to them how seemingly spontaneously generated semantic maps helped graphically display meaning-based connections between obvious knowledge and a set of creative design actions without too much effort and stress. The seamless transition of the learning from individual experience to teamwork helped them unpack observations and insights from the presentation collectively and develop design leads. The student reported how the clarity in understanding the context, issues, challenges, and stakeholder-needs, as creative design touch points, made it easy to reflect on initial solutions. The students also shared how they applied the method to other design briefs for other modules and found it very useful, creative and easy to apply.

One student quoted "How I missed the class and felt bad later as one of my friends told me how they worked with music and developed some great ideas. It was creative and fun way to work." Another student reported "I was confused first when asked not to think and just filter words popping out, but later I thoroughly enjoyed reacting to, and processing ideas, instinctively".

4. Narratives in Design Toolkit

The Narrative in Design Toolkit is based on the Grimaldi et al.'s Narratives in Design framework to analyse the ways in which narratives are used in design (Grimaldi et al., 2013). Narrative is used quite a lot in the human-centred design process, through more ubiquitous methods such as design ethnographies, user personas, or product narratives attached to brands, but the contribution of the narrative qualities to the design are not precisely defined. In addition, narrative is central to the way we interpret events and the way we assimilate these into our own life stories.

Narratives in Design Toolkit is a card set which re-elaborates and simplifies the framework described in Grimaldi et al (2013), dividing it up into five cards, Who, What, Where, When and Why. It is a method to both analyse the narrative features present in existing designs and to generate new design work based on its narrative qualities. This method helps talk about the ways in which design may be interpreted in a narrative way and enables a language to talk about narrative features of design work both in an analytical context and within generative phases of a project. When used in a generative way, the toolkit helps to envision how a design outcome may be interpreted in a narrative manner, before the design has been generated. The Toolkit therefore allows designers to refine a brief to the point of a concept, in a very human-centred way.

Service design is particularly tied to narrative because of its user-centred approach, its reliance on narrative forms of user research, such as ethnography and experience mapping, and the fact that services are necessarily experienced over time, and narrative is the mechanism we as humans use to make sense of time-based events (Abbott, 2008). Narrative is also particularly good at conveying complex sets of information that needs to be remembered (Lloyd, 2000), as well as empathising with people (Wright and McCarthy, 2008); these are both particularly important aspects to service design projects.

Table 4: Narrative Toolkit Operative Framework

	FRONT	BACK
INSTRUCTIONS	<p>Narratives in Design a toolkit to analyse the use of narrative in design, and to help define the use of narrative in the design process.</p> <p>Mark your answers on each card as you go through them.</p>	<p>These cards are designed to help you assess the way narrative is used in existing design examples, as well as help guide your use of narrative during the design process.</p> <p>To redesign or reposition existing work, change the answer on one or more of the cards, and redesign accordingly.</p> <p>To create new work, answer the questions on the card as part of the idea generation process, keeping an open mind in terms of repositioning design work.</p>
DESCRIBE the narrative	<p>.....</p> <p>.....</p> <p>.....</p>	<p>Please describe in your own terms the narrative(s) present within this design example. You might find it easier to discuss this with someone before writing it down.</p>
DETAILS	<p>Designer:</p> <p>Project:</p> <p>Year:</p> <p>Where & when was this filled out?</p>	<p>Your name (leave blank if you wish to remain anonymous)</p> <p>Your email address (leave blank if you don't want to receive updates on the project)</p>
WHO	<p>CREATOR → AUDIENCE</p> <p>User → User</p> <p>User → Designer</p> <p>Designer → Designer</p> <p>Designer → User</p>	<p>Who creates the narrative and who is the audience of this narrative?</p> <p>Designers may create narratives for users, but they may also create narratives for the design team. In the same way, users may be creating the narrative for themselves or other users, or for the design team.</p>
WHEN	<p>In the design process</p> <p>In the user experience</p>	<p>When is narrative present?</p> <p>Is the narrative used within the design process, for example as a research tool or as an idea generation tool, or is it designed into the user experience of the object, for example through associated stories or trajectories through space?</p>
WHERE	<p>Internal to the object</p> <p>External to the object</p>	<p>Is the narrative internal to the object or external to the object?</p> <p>An internal narrative is understood by looking at or using the object without requiring additional information.</p> <p>An external narrative is understood only after referring to additional information not contained in the object itself. For example the user may need to read something, view an accompanying video, or hear an explanation.</p>
WHY	<p>Communication & Conveying Information</p> <p>Evoking Reflectivity</p> <p>Showing & Teaching Values</p> <p>Empathy, Identification & Bypassing Social Structures</p> <p>Imagination & Creativity</p> <p>Memorability</p> <p>Engaging & Delighting</p> <p>Persuading</p> <p>Cohesion & Comprehension</p>	<p>Why is narrative used, to what effect?</p> <p>In this card we are interested in what the narrative does, within the context of the design, as opposed to what effects the design itself has. For example, an object might delight because of its physical appearance but not through a narrative.</p>
WHAT	<p>Minimal Narrative</p> <p>Sequenced Narrative</p> <p>Logically Sequenced Narrative</p> <p>Value-Laden Narrative</p> <p>Entertainment Narrative</p>	<p>What type of narrative is present?</p> <p>Minimal Narrative: a representation of one or more events.</p> <p>Sequenced Narrative: a representation of one or more characters or entities in a series of chronological events.</p> <p>Logically Sequenced Narrative: Sequenced Narrative where chronological events are connected by causality or agency.</p> <p>Value-Laden Narrative: an emotion-evoking and value-laden Logically Sequenced Narrative.</p> <p>Entertainment Narrative: a Value-Laden Narrative, which progresses through conflicts toward a climax.</p>
FEEDBACK	<p>.....</p> <p>.....</p> <p>.....</p>	<p>For more information about the Narratives in Design workshops: narrativesindesign.wordpress.com or email Silvia Grimaldi on s.grimaldi@lcc.arts.ac.uk</p>



Figure 3: The Narrative Toolkit helps students to envision how a design outcome may be interpreted in a narrative manner, before the design has been generated

Fourteen Service Design postgraduate students participated in the two-hour workshop. They were first trained in using the cards by describing their own experience of a service, and then analysed this narrative with the Toolkit. Following this, students were asked to write down all the narratives that they had accumulated through the first phases of their current project, which involved focus groups with service users and providers, and analyse these narratives using the Toolkit. In the final stage of the workshop students were asked to use the Toolkit to define a narrative about the final outcome of the project, thus defining the way in which this service would communicate to users and would be received by users, before defining what the service actually is. This narrative could be written from any stakeholder's point of view and outlined what the consequences of the project would be as opposed to what form the project would take. This in part mimics the technique used in Invisible Design (Briggs et al., 2012), with the toolkit aiding in the construction of that envisioned narrative.

Observations during the session showed that the initial exercise was necessary to understanding the method, as a lot of questions were asked and clarified through this phase. The majority of students were able to use the cards as an analytic tool, with some students requiring facilitation in this task. When it came to using the tool as a generative method, students were able to immerse themselves in writing the narrative.

Observing the results that were shared at the end of the session it is clear that engaging with a narrative from a particular point of view enabled students to identify ideal outputs or ideal final situations for the project as well as enabling students to empathise with different stakeholders. From the informal oral feedback at the end of the session and the formal feedback collected from the zines it emerged that several students were able to use this tool to envision what the effects of the final design outcome could be on the different stakeholders and hence had a better idea of what they could design to get the desired effect. Some of these students reported this being the first time they were able to envision an outcome. Most students also engaged in the way in which a final service outcome could be presented back to the different stakeholders.

5. Zine Method

The Zine Method utilises a multi-page technique from the graphic arts, the zine, as a space where elements of a problem area or a solution can be mapped via the visual plane. Going beyond the single page format, the zine allows for multi-page and multi-dimensional expressions to come into contact with each other; for example visual notions that have not been connected in the mind of the participant can be juxtaposed via this approach while still retaining their individual integrity in the single page. The zine format applied here was developed by Biagioli and co-designed with Allan Owens and Anne Pässilä for application during the IFKAD 2016 conference (Biagioli, Owens, and Pässilä 2016). This format allows for notations to be made on the single page plane, so that focus can be applied to the singularity of that image, while at the same time allowing for an overview of the project to happen via the cuts and folds built into the construction of the zine. These allow for multiple ways of structuring and 'reading' the information and for various juxtapositions to be made depending on proximity of spreads. There is an element of chance built into this design that frees the participant temporarily from making causal relationships between elements, and allows those relationships to emerge depending on how the structure is presented. It is a method that encourages intentional play, much like a game or a puzzle.

Via the Zine Method, complex sets of elements can be represented in one package (the zine) letting ideas emerge from the active handling of the paper matter; by folding in different ways, by setting up the zine into a three-dimensional structure that refers to a larger concept taking shape in the mind of the participant. It is an emergent framework that expresses as an active process the subjective engagement with complexity and ambiguity in problem solving.

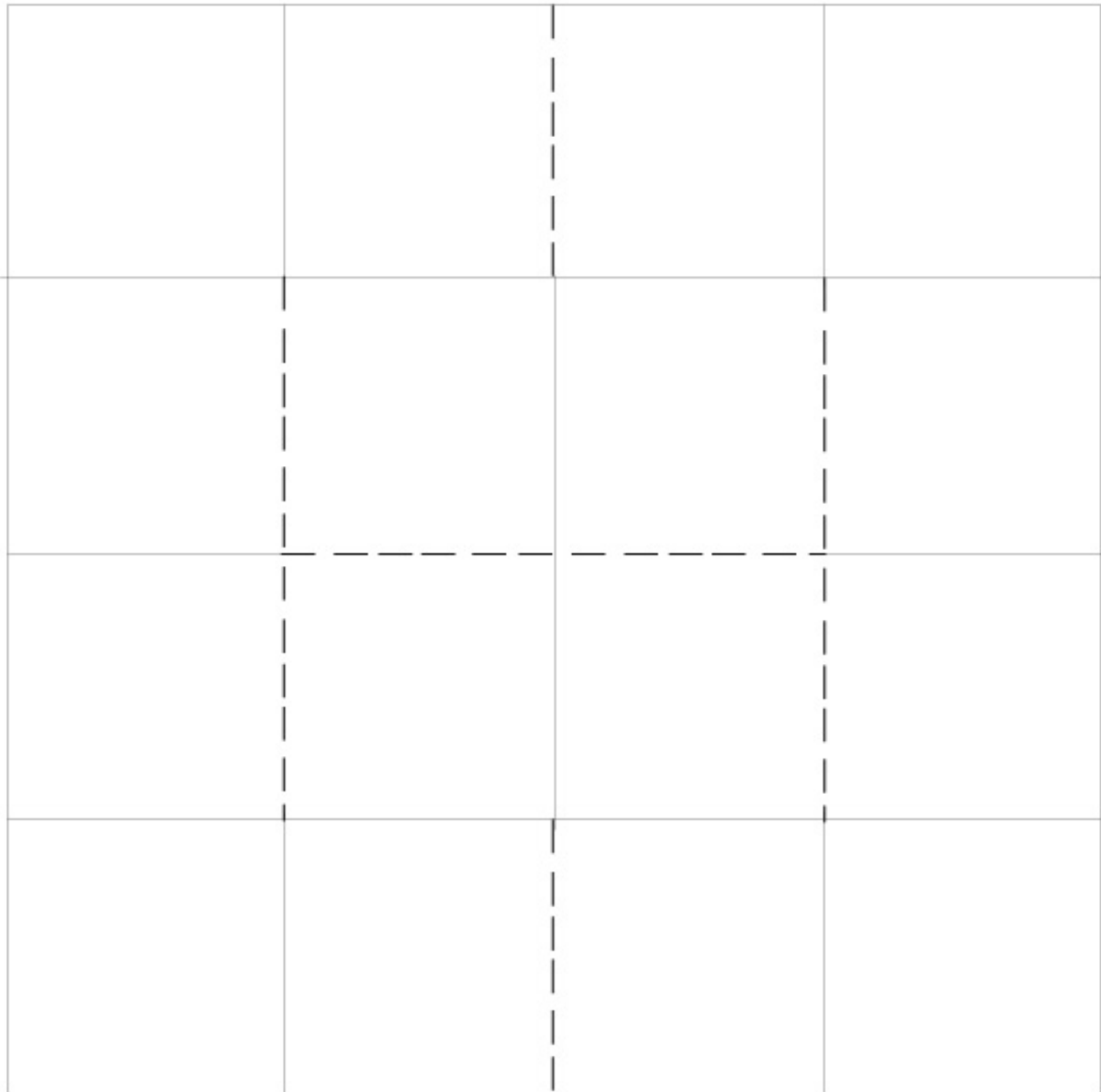
Because of its playful format, the students first engaged with the zine by folding and unfolding it, trying to figure out the possibilities of its construction. The researcher expected students to apply visuals singularly on each page and then allow for all those single expressions to come together in a variety of ad hoc constructions.

Instead, a majority of the students worked out a holistic concept for the zine and used the single pages to represent the various, complex elements within that structure. This took the format into new applications not expected at the onset of the research session. The MA students applied the format in three key ways as an active part of presenting their current projects on the course: used as a material prototype/visual aid to visually express how the student frames the problem (Shaika); used to demonstrate how the student is going about solving the problem (Tritra); used as an actual early version, rough prototype of the outcome intended for the project (Jeff).

The Zine Method proved to be a strong visualising tool—a method of paper prototyping—that allowed the student to model the problem area and/or its solution and use that model as an active element of presenting the idea.

Zine Method Construction

- * Cut paper into 21cm x 21cm square
- * Fold paper into 16 squares
- * Cut within the zine construction as indicated by the dotted lines



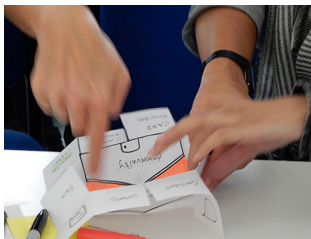
Construction developed from existing zine format (Golden 2010) and applied by the research team of Monica Biagioli, Allan Owens, and Anne Pässilä during the IFKAD 2016 Conference in Dresden, Germany. June 2016.

source: Zines as qualitative forms of analysis. 2016

Figure 4: Method Construction



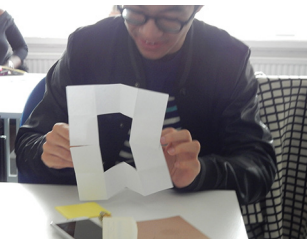
Mapping emotions during project through drawing. Signe. Detail from her conclusion zine. 2016



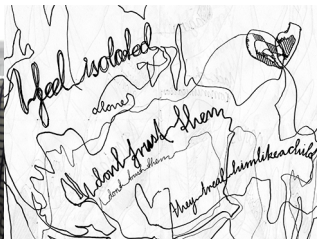
Framing the problem.
Shaika. 2016



Solving the problem.
Tritra. 2016



Prototyping the solution.
Jeff. 2016



Reflecting on emotion.
Signe. 2016

Figure 5: Mapping Emotions

During the Zine Method session, students would report back on how they were using the method without prompting and the researcher recorded these reflections. At the conclusion of the session, we went over as a group the key uses of the Zine Method.

- Mapping the project ahead (prototype)
- Emotional relationships map/record (uncertainties)
- Finding relationships out of random placements

- Using form of zine as metaphor (a house, for example)
- Brainstorming around a theme
- Storytelling—use as communication tool
- Focus of each member of a team
- What is going on with yourself
- Connect disconnected elements
- The juxtapositions of the format work really well
- Nice method to mix it up
- Embrace the uncertainty

These can be grouped into three categories:

A way to progress the project iteratively. This is done by applying the format to map the project ahead; use it as metaphor; brainstorm ideas around one theme on the format; and create a narrative through it that operates as a communication tool.

A way to reflect subjectively on own engagement with the process/project/team working. Each zine can focus on various members of a team to identify their position and contribution to developing project. It can serve as a self-reflection tool; “what is going on with yourself”

As a contained way to address complexity and ambiguity in solving a problem. It can map and record uncertainties within the process and how emotion plays a role in decision-making. It can help find relationships out of random placements and connect elements previously disconnected.

The students generally commented that the juxtapositions of the format work really well to mix things up at key points of the process and help the designer embrace uncertainty at key stages of a process.

This was the feedback emailed to the researcher by one of the session participants (Anupa):

“Our [project] group used the zine as one of our iterative methods where we created another one. Could understand the process better.

1. A great iterative method which helps link unrelated ideas.
2. The formation of multiple ideas at one session helps you time manage better.
3. The themes that are generated, are either strong or weak, so it helps the individual or group to deliberate, articulate and generate constructively.
4. Multiple zines can be used at the project and session, either with similar themes or unrelated. The inferences lead to better insights. Helps in Co creation.
5. I feel the zine methodology is similar to the agile method - the process of creation to execution to insight building to revisiting.”

Two participants used the zine format to document their emotional state during the project, and used it as well to map the emotional state of those they interviewed as part of their work on the project. This is

a key application of the method, as there are so few opportunities to properly account for emotion in project development and evaluation.

5. Conclusions and discussion



Figure 6: All three methods employed as a methodology for effective student engagement and sustainable design generation

The three methods engage with complexity, drawing on emotion and subjectivity to foment student involvement with a process and actively engage creativity for service design pedagogy.

The researchers designed this pedagogy to bring design skills and knowledge to the foreground as integral components of learning and experimenting; enhanced student engagement through innovative teaching methods; and as demonstrated in the feedback sessions, provided a richer learning experience so as to generate a deeper understanding of problem area and solution for the students involved in the sessions.

Our contribution is in three key areas: addressing complexity, addressing personal points of view and narratives, and acknowledging the role of emotion in the process of analysis. Service design projects are complex. Creative teaching facilitates understanding through the organisation and interpretation of project information and encourages connections to emerge from the process. The key element is to break up the brief/initial info/ text and pull out information that can help initiate the research from an informed baseline (discover and define phase) to the more open and creative ideation of design outcomes (develop phase). Engaging with narratives in the process of envisioning design outcomes allows students to easily empathise with stakeholders and interpret the design from their point of view. The zine construction foments exploration of the project space in all its facets, and also allows for prototyping the solution. Personal perspectives can be expressed via folds, cuts, and placement in three dimensional space. All three methods can be especially useful when there is conflict or a project has stalled. Emotions are made visible and can in that way be a part of the analysis at key junctures in the project. If foregrounded at the very beginning of a project for both stakeholders and designers by structuring interactions to account for them, then their emergence throughout the project can be better managed. This is a key finding, as the emotional dimension is often not captured in the analysis process, and yet, it is a key component in decision-making (Pässilä and Owens 2016; Gill 2016; Damasio 2000).

Using only one method for evaluation at the completion of the project, the zine method, worked to reinforce ideas through the method. Findings related more to its application and it is believed by the researchers that this was a format bias. The finding from this is that in future testing of various methods with one group, the researchers would make all methods available for conclusions and evaluation; in this way giving the participant control over the way findings would be organised and presented. This could in turn allow for hybridising of methods at the evaluation stage, perhaps combining all three in one format.

This initial research suggests that these methods have a lot of potential to fill specific gaps within Service Design Pedagogy. The next steps in this project will be to continue testing and refining these methods by embedding them throughout project work on an MA in Service Design, continue to test applicability to other projects within the service design field and continue to identify pedagogical gaps to address through design methods.

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